WHAT IS CLAIMED IS:

1. A surface optical apparatus comprising:

a surface optical device with a p-side electrode and an n-side electrode;

a first substrate for supporting said surface optical device; and

a first electrode wiring comprising at least a wire formed on said first substrate and electrically connected to said p-side electrode or said n-side electrode, a current injected into or a voltage applied across said surface optical device through said first electrode wiring and said p-side electrode and said n-side electrode.

2. A surface optical apparatus according to claim 1, wherein said surface optical device includes a member with a minute opening for passing light therethrough.

3. A surface optical apparatus according to claim 2, wherein said minute opening is formed such that evanescent light is generated thereby.

4. A surface optical apparatus according to claim 2, wherein said minute opening is formed in a minute protrusion member provided at a light passing portion of said surface optical device.

5. A surface optical apparatus according to claim 1, wherein said surface optical device is supported by said first substrate

through an elastic supporter, and said first electrode wiring is formed on said first substrate and said elastic supporter.

6. A surface optical apparatus according to claim 5, wherein said first substrate comprises an Si substrate with an SiN_x thin layer formed thereon, and said elastic supporter comprises a portion of said SiN_x thin layer under which said Si substrate is removed.

7. A surface optical apparatus according to claim 5, wherein said first substrate comprises an Si substrate with an SiO_2 thin layer and an Si thin layer formed thereon in this order, and said elastic supporter comprises a portion of said Si thin layer under which said Si substrate and said SiO_2 thin layer are removed.

8. A surface optical apparatus according to claim 7, wherein said wire includes a portion formed by doping said Si thin layer in a predetermined pattern.

9. A surface optical apparatus according to claim 5, wherein a plurality of said surface optical devices are arranged on said elastic supporter.

10. A surface optical apparatus according to claim 5, wherein said elastic supporter is shaped into a cantilever, and said surface optical device is placed on a tip of said cantilever.

11. A surface optical apparatus according to claim 5, wherein said elastic supporter is shaped as a trapezoidal cantilever whose central portion is removed.

12. A surface optical apparatus according to claim 1, wherein said surface optical device comprises a surface emitting semiconductor laser.

13. A surface optical apparatus according to claim 1, wherein said surface optical device comprises thin semiconductor layers grown on a second substrate, and said second substrate is mounted on said first substrate.

14. A surface optical apparatus according to claim 1, wherein said surface optical device comprises thin semiconductor layers with a functional portion which is formed by growing said thin semiconductor layers on a second substrate, and said functional portion without the second substrate is mounted on said first substrate.

15. A surface optical apparatus according to claim 1, wherein said first electrode wiring comprises two wires connected to said p-side electrode and said n-side electrode of said surface optical device, respectively.

16. A surface optical apparatus according to claim 15, further comprising an insulating portion formed on an end face of

said surface optical device to smooth a step at said end surface, and wherein one of said two wires is electrically connected to one of said p-side electrode or said n-side electrode of said surface optical device on a side of said first substrate and the other of said two wires is laid over said insulating portion and electrically connected to the other of said p-side electrode or said n-side electrode on an upper surface of said surface optical device.

17. A surface optical apparatus according to claim 15, wherein said p-side electrode and said n-side electrode of said surface optical device are formed on the same side of said surface optical device, and said two wires are electrically connected to said p-side electrode and n-side electrode, respectively.

18. A surface optical apparatus according to claim 1, comprising a plurality of said surface optical devices.

19. A surface optical apparatus according to claim 1, wherein said surface optical device comprises a surface light emitting device, said surface light emitting device being supported by said first substrate through an elastic supporter, and said first electrode wiring is formed on said first substrate and said elastic supporter, and further comprises a photodetector having a p-side electrode and an n-side electrode to detect output light of said surface light emitting device, said photodetector being positioned in the vicinity of said surface light emitting

device.

20. A surface optical apparatus according to claim 19, wherein said surface light emitting device comprises a member with a minute opening for passing light therethrough.

21. A surface optical apparatus according to claim 20, wherein said minute opening is formed such that evanescent light is generated thereby.

22. A surface optical apparatus according to claim 20, wherein said minute opening is formed in a minute protrusion member provided at a light emitting portion of said surface light emitting device on a side opposite to a side where said photodetector is positioned.

23. A surface optical apparatus according to claim 19, wherein said surface light emitting device comprises a surface emitting semiconductor laser.

24. A surface optical apparatus according to claim 19, wherein said surface light emitting device comprises thin semiconductor layers grown on a second substrate, and said second substrate is mounted on said elastic supporter.

25. A surface optical apparatus according to claim 19, wherein said surface light emitting device comprises thin

semiconductor layers with a functional portion which is fabricated by growing said thin semiconductor layers on a second substrate, and said functional portion without the second substrate is mounted on said elastic supporter.

26. A surface optical apparatus according to claim 19, wherein said first substrate comprises an Si substrate with an SiN_x thin layer formed thereon, and said elastic supporter comprises a portion of said SiN_x thin layer under which said Si substrate is removed.

27. A surface optical apparatus according to claim 19, wherein said first substrate comprises a substrate with a metal thin layer formed thereon, and said elastic supporter comprises a portion of said metal thin layer under which said substrate is removed.

28. A surface optical apparatus according to claim 19, wherein said first substrate comprises an Si substrate with an SiO_2 thin layer and an Si thin layer formed thereon in this order, and said elastic supporter comprises a portion of said Si thin layer under which said Si substrate and said SiO_2 thin layer are removed.

29. A surface optical apparatus according to claim 28, wherein said photodetector comprises one of a photodiode and an FET integrally formed at a position on said elastic supporter of said Si thin layer, at which said photodetector can detect output

light of said surface light emitting device, by controlling doping of said Si thin layer, and further comprises a second electrode wiring comprising of two wires formed on said first substrate and said elastic supporter and electrically connected to said p-side electrode and said n-side electrode of said photodetector, respectively, to drive said photodetector.

30. A surface optical apparatus according to claim 28, wherein said photodetector comprises a Schottky-barrier-type photodetector with a contact between metal and semiconductor integrally formed at a position on said elastic supporter of said Si thin layer, at which said photodetector can detect output light of said surface light emitting device, and further comprising a second electrode wiring of two wires formed on said first substrate and said elastic supporter and electrically connected to said p-side electrode and said n-side electrode of said photodetector, respectively, to drive said photodetector.

31. A surface optical apparatus according to claim 19, wherein said photodetector is integrally laid down on said surface light emitting device with a junction therebetween, and said photodetector and said surface light emitting device are placed on said elastic supporter, and said photodetector further comprising a second electrode wiring of two wires formed on said first substrate and said elastic supporter and electrically connected to said p-side electrode and said n-side electrode of said photodetector, respectively, to drive said photodetector.

32. A surface optical apparatus according to claim 19, further comprising a third substrate, and wherein said photodetector is formed on said third substrate, and said third substrate is aligned with and bonded to said first substrate in such a manner that said photodetector can monitor output light of said surface light emitting device emitted to a side of said third substrate.

33. A surface optical apparatus according to claim 19, wherein said first electrode wiring comprises two wires connected to said p-side electrode and said n-side electrode of said surface light emitting device, respectively.

34. A surface optical apparatus according to claim 33, further comprising a second electrode wiring comprising two wires formed on the first substrate, wherein one of said p-side electrode or said n-side electrode of said surface light emitting device and one of said p-side electrode or said n-side electrode of said photodetector are electrically connected to each other to be a common electrode, one of said two wires of said first electrode wiring and one of said two wires of said second electrode wiring are connected to said common electrode to be a common wire, and the other of said two wires of said first electrode wiring and the other of said two wires of said second electrode wiring are separately formed.

35. A surface optical apparatus according to claim 33,

further comprising an insulating portion formed on an end face of said surface optical device to smooth a step at said end surface, and wherein one of said two wires of said first electrode wiring is electrically connected to said p-side electrode or said n-side electrode of said surface optical device on a side of said first substrate and the other of said two wires of said first electrode wiring is laid over said insulating portion and electrically connected to said p-side electrode or said n-side electrode on an upper surface of said surface optical device.

36. A surface optical apparatus according to claim 33, wherein said p-side electrode and said n-side electrode of said surface optical device are formed on the same side of said surface optical device, and said two wires of said first electrode wiring are electrically connected to said p-side electrode and said n-side electrode, respectively.

37. A surface optical apparatus according to claim 19, comprising a plurality of said photodetectors.

38. A surface optical apparatus according to claim 19, wherein a plurality of said photodetectors are arranged on said elastic supporter.

39. A surface optical apparatus according to claim 19, wherein said elastic supporter is in a cantilever shape, and said surface light emitting device is placed on a tip of said

cantilever.

40. A surface optical apparatus according to claim 19, wherein said elastic supporter is in a trapezoidal cantilever shape whose central portion is removed.

41. A surface optical apparatus according to claim 5, wherein said elastic supporter comprises a plurality of thin layers which are the same as at least a portion of a functional portion of said surface optical device comprising of a plurality of thin layers formed on said first substrate, said elastic supporter and said surface optical device are continuously formed, and a portion of said first substrate under said elastic supporter and said surface optical device is removed.

42. A surface optical apparatus according to claim 41, wherein said surface optical device includes a member with a minute opening for passing light therethrough.

43. A surface optical apparatus according to claim 42, wherein said minute opening is formed such that evanescent light is generated therethrough.

44. A surface optical apparatus according to claim 42, wherein said minute opening is formed in a minute protrusion member provided at a light passing portion of said surface optical device.

45. A surface optical apparatus according to claim 42, wherein said minute opening is formed in a minute protruding member which protruding member is formed from an uppermost layer of said functional portion of said surface optical device and covered with a light-blocking layer with only a tip of said protruding member uncovered.

46. A surface optical apparatus according to claim 41, wherein said functional portion of said surface optical device comprise a plurality of semiconductor thin layers epitaxially formed on said first substrate.

47. A surface optical apparatus according to claim 41, wherein said functional portion of said surface optical device includes a cladding layer, and said elastic supporter includes a layer which is the same as said cladding layer.

48. A surface optical apparatus according to claim 41, wherein said functional portion of said surface optical device includes a semiconductor multi-layer mirror, and said elastic supporter includes a plurality of layers which are the same as said semiconductor multi-layer mirror.

49. A surface optical apparatus according to claim 41, wherein said functional portion of said surface optical device includes a dielectric multi-layer mirror, and said elastic supporter includes a plurality of layers which are the same as said

dielectric multi-layer mirror.

50. A surface optical apparatus according to claim 41, wherein said surface optical device comprises a surface emitting semiconductor laser.

51. A surface optical apparatus according to claim 41, wherein said plurality of thin layers include at least one of a layer of GaAs, a layer of AlGaAs and a layer of InGaAs, and said first substrate comprises a substrate of GaAs.

52. A surface optical apparatus according to claim 41, wherein said plurality of thin layers include at least one of a layer of GaN, a layer of AlGaN and a layer of InGaN.

53. A surface optical apparatus according to claim 41, wherein said first electrode wiring includes a wire formed of an electrically-conductive layer of said elastic supporter.

54. A surface optical apparatus according to claim 41, wherein a plurality of said surface optical devices are placed on a plurality of said elastic supporters supported by said first substrate, with each said surface optical device spaced on a different said elastic supporter.

55. A surface optical apparatus according to claim 41, wherein a plurality of said surface optical devices are arranged

on said elastic supporter.

56. A surface optical apparatus according to claim 41, further comprising a third substrate and a photodetector formed on said third substrate, and wherein said surface optical device comprises a surface light emitting device, and said third substrate is aligned with and bonded to said first substrate in such a manner that said photodetector can monitor output light of said surface light emitting device emitted to a side of said third substrate.

57. A surface optical apparatus according to claim 56, wherein said third substrate comprises an Si substrate, and said photodetector comprises one of a photodiode and an FET integrally formed at a position, at which said photodetector can detect output light of said surface light emitting device, by controlling doping of said third substrate.

58. A surface optical apparatus according to claim 56, wherein said third substrate comprises an Si substrate, and said photodetector comprises a Schottky-barrier-type photodetector with a contact between metal and semiconductor integrally formed at a position at which said photodetector can detect output light of said surface light emitting device.

59. A surface optical apparatus according to claim 41, further comprising a photodetector, and wherein said surface

optical device comprises a surface light emitting device, said photodetector is integrally laid down on said surface light emitting device with a junction therebetween, and said surface light emitting device and said photodetector are spaced on said elastic supporter.

60. A surface optical apparatus according to claim 41, wherein said elastic supporter is in a cantilever shape, and said surface optical device is placed on a tip of said cantilever.

61. A surface optical apparatus according to claim 5, wherein said elastic supporter has a bimorphic structure in which a pair of electrodes sandwiching a layer of piezoelectric material are formed on each of upper and lower surfaces thereof such that said elastic supporter can be adjustably moved when an electric field is applied across said layer of piezoelectric material.

62. A surface optical apparatus according to claim 5, wherein said elastic supporter has a bimorphic structure in which a pair of electrodes sandwiching a layer of piezoelectric material are formed on each of upper and lower surfaces thereof such that a motion of said elastic supporter can be detected through electric carriers induced in said layer of piezoelectric material.

63. A surface optical apparatus comprising:

an elastic supporter; and

a surface optical device comprising a member with a minute

opening for passing light therethrough, said surface optical device placed on a tip of said elastic supporter.

64. A surface optical apparatus according to claim 63, wherein said elastic supporter is in a cantilever shape.

65. A surface optical apparatus according to claim 63, wherein said elastic supporter includes a layer constituting said surface optical device.

66. A method of fabricating a surface optical apparatus having a surface optical device with a p-side electrode and an n-side electrode, a first substrate for supporting the surface optical device through an elastic supporter, and an electrode wiring comprising of at least a wire formed on the elastic supporter and electrically connected to the p-side electrode or the n-side electrode, and in which a current is injected into or a voltage is applied across the surface optical device through the electrode wiring and the p-side electrode and the n-side electrode, the surface optical device includes functional layers grown on a second substrate of semiconductor, and the second substrate is mounted on the elastic supporter, said method comprising the steps of:

forming a layer of the elastic supporter on the first substrate;

forming the functional layers of the surface optical device on the second substrate;

forming a current injection region and the p-side electrode and the n-side electrode of the surface optical device in the functional layers;

forming the electrode wiring on the layer of the elastic supporter;

bonding the p-side electrode or the n-side electrode of the surface optical device to the electrode wiring on the elastic supporter; and

etching a portion of the first substrate under the surface optical device and the electrode wiring.

67. A method of fabricating a surface optical apparatus having a surface optical device with a p-side electrode and an n-side electrode, a first substrate for supporting the surface optical device through an elastic supporter, and an electrode wiring comprising of at least a wire formed on the elastic supporter and electrically connected to the p-side electrode or the n-side electrode, and in which a current is injected into or a voltage is applied across the surface optical device through the electrode wiring and the p-side electrode and the n-side electrode, and the surface optical device includes functional layers grown on a second substrate of semiconductor, said method comprising the steps of:

forming a layer of the elastic supporter on the first substrate;

forming the functional layers of the surface optical device on the second substrate;

forming the electrode wiring on the layer of the elastic supporter;

bonding an upper surface of the functional layers of the surface optical device to the electrode wiring on the elastic supporter by using a direct solid-phase junction;

removing the second substrate with the functional layers being left on the elastic supporter; and

etching a portion of the first substrate under the surface optical device and the electrode wiring.

68. A method of fabricating a surface optical apparatus having a surface light emitting device with a p-side electrode and the n-side electrode, a first substrate for supporting the surface light emitting device through an elastic supporter, an electrode wiring comprising of at least a wire formed on the elastic supporter and electrically connected to the p-side electrode or the n-side electrode, and a photodetector formed on a third substrate, and in which a current is injected into or a voltage is applied across the surface light emitting device through the electrode wiring and the p-side electrode and the n-side electrode, the surface light emitting device includes functional layers grown on a second substrate of semiconductor, and the second substrate is mounted on the elastic supporter, said method comprising the steps of:

forming a layer of the elastic supporter on the first substrate;

forming the functional layers of the surface light emitting

device on the second substrate;

forming a current injection region and the p-side electrode and the n-side electrode of the surface light emitting device in the functional layers;

forming the electrode wiring on the layer of the elastic supporter;

bonding at least one of the p-side electrode or the n-side electrode of the surface light emitting device to the electrode wiring on the elastic supporter;

etching a portion of the first substrate under the surface optical device and the electrode wiring; and

aligning the third substrate with and bonding the third substrate to the first substrate in such a manner that the photodetector can monitor output light of the surface light emitting device emitted to a side of the third substrate.

69. A method of fabricating a surface optical apparatus having a surface optical device with a p-side electrode and an n-side electrode, a first substrate for supporting the surface optical device through an elastic supporter, and an electrode wiring comprising of at least a wire formed on the elastic supporter and electrically connected to the p-side electrode or the n-side electrode, and in which a current is injected into or a voltage is applied across the surface optical device through the electrode wiring and the p-side electrode and the n-side electrode, and the surface optical device includes functional layers, said method comprising the steps of:

forming the functional layers of the surface optical device on the first substrate;

forming a current injection region and the p-side electrode and the n-side electrode of the surface optical device in the functional layers;

etching the functional layers into a shape of the elastic supporter; and

etching a portion of the first substrate from a side opposite to a side of the functional layers.

70. A method of fabricating a surface optical apparatus having a surface light emitting device with a p-side electrode and an n-side electrode, a first substrate for supporting the surface light emitting device through an elastic supporter, an electrode wiring comprising of at least a wire formed on the elastic supporter and electrically connected to the p-side electrode or the n-side electrode, and a photodetector formed on a second substrate, and in which a current is injected into or a voltage is applied across the surface light emitting device through the electrode wiring and the p-side electrode and the n-side electrode, and the surface light emitting device includes functional layers, said method comprising the steps of:

forming the functional layers of the surface light emitting device on the first substrate;

forming a current injection region and the p-side electrode and the n-side electrode of the surface light emitting device in the functional layers;

etching the functional layers into a shape of the elastic supporter;

etching a portion of the first substrate from a side opposite to a side of the functional layers;

forming the photodetector on the second substrate; and

aligning the second substrate with and bonding the second substrate to the first substrate such that the photodetector can monitor output light of the surface light emitting device emitted to a side of the second substrate

71. A method of using a surface optical apparatus as a detector of information on a medium surface, the surface optical apparatus having a surface optical device with a p-side electrode and an n-side electrode, a substrate for supporting the surface optical device, and an electrode wiring comprising of at least a wire formed on the substrate and electrically connected to the p-side electrode or the n-side electrode, and in which a current is injected into or a voltage is applied across the surface optical device through the electrode wiring and the p-side electrode and the n-side electrode, said method comprising the steps of:

injecting a current into the surface optical device to emit light to the medium surface from the surface optical device; and

detecting an intensity of scattering light returned to the surface optical device from the medium surface through a variation in the current or the voltage across the electrodes of the surface optical device.

72. A method of using a surface light emitting apparatus as a detector of information on a medium surface, the surface light emitting apparatus having a surface light emitting device with a p-side electrode and an n-side electrode, a substrate for supporting the surface light emitting device, an electrode wiring comprising of at least a wire formed on the substrate and electrically connected to the p-side electrode or the n-side electrode, and a photodetector placed on a side of the surface light emitting device opposite to the medium surface, and in which a current is injected into or a voltage is applied across the surface light emitting device through the electrode wiring and the p-side electrode and the n-side electrode, said method comprising the steps of:

injecting a current into the surface light emitting device to emit light to the medium surface from the surface light emitting device; and

detecting a variation in light emitted toward the photodetector from the surface light emitting device by the photodetector, the variation being caused by a change in an intensity of scattering light returned to the surface light emitting device from the medium surface.

73. A method of using a surface optical apparatus as an optical information recording apparatus, the surface optical apparatus having a surface optical device with a p-side electrode and an n-side electrode and a member with a minute opening for generating evanescent light, a substrate for supporting the

surface optical device, and an electrode wiring comprising of at least a wire formed on the substrate and electrically connected to the p-side electrode or the n-side electrode, and in which a current is injected into or a voltage is applied across the surface optical device through the electrode wiring and the p-side electrode and the n-side electrode, said method comprising the steps of:

injecting the current into the surface optical device modulated in accordance with a signal information; and

applying evanescent light to a surface of an optical recording medium from the surface optical device to record the information on the medium surface.

74. A method of using a surface optical apparatus as an optical exposure apparatus, the surface optical apparatus having a surface optical device with a p-side electrode and an n-side electrode and a minute protrusion member with a minute opening for generating evanescent light, a substrate for supporting the surface optical device, and an electrode wiring comprising of at least a wire formed on the substrate and electrically connected to the p-side electrode or the n-side electrode, and in which a current is injected into or a voltage is applied across the surface optical device through the electrode wiring and the p-side electrode and the n-side electrode, said method comprising the steps of:

injecting the current into the surface optical device on the basis of a signal; and

applying evanescent light to a photosensitive medium from the surface optical device to form an optically-exposed pattern on the medium.

75. A method of using a surface optical apparatus having a surface optical device with a p-side electrode and an n-side electrode and a minute protrusion member electrically connected to the p-side electrode or the n-side electrode, a substrate for supporting the surface optical device, and an electrode wiring comprising of at least a wire formed on the substrate and electrically connected to the p-side electrode or the n-side electrode, and in which a current or a tunnel current is injected into or a voltage is applied across the surface optical device through the electrode wiring and the p-side electrode and the n-side electrode, said method comprising the steps of:

bringing a tip of the minute protrusion member in contact with or close to a surface of a medium; and

causing the current or the tunnel current to flow into the medium to perform an observation of the conductive medium, a tracking on the medium, or an information recording in the conductive medium.

76. A method of using a surface optical apparatus as a scanning tunnel microscope, the surface optical apparatus having a surface optical device with a p-side electrode and an n-side electrode and a minute protrusion member electrically connected to the p-side electrode or the n-side electrode, a substrate for

supporting the surface optical device, and an electrode wiring of at least a wire formed on the substrate and electrically connected to the p-side electrode or the n-side electrode, and in which a current or a tunnel current is injected into or a voltage is applied across the surface optical device through the electrode wiring and the p-side electrode and the n-side electrode, said method comprising the steps of:

bringing a tip of the minute protrusion member in contact with or close to a surface of a conductive medium; and

causing the current or the tunnel current to flow into the surface optical device through the conductive medium and the minute protrusion member; and

detecting a change in the current or the voltage across the p-side electrode and the n-side electrode caused by a condition of the surface of the conducting medium.

77. A method of using a surface optical apparatus as a scanning tunnel microscope, the surface optical apparatus having a surface light emitting device with a p-side electrode and an n-side electrode and a minute protrusion member electrically connected to the p-side electrode or the n-side electrode, a substrate for supporting the surface light emitting device, an electrode wiring comprising of at least a wire formed on the substrate and electrically connected to the p-side electrode or the n-side electrode, and a photodetector for receiving light from the surface light emitting device, and in which a current or a tunnel current is injected into or a voltage is applied across the

surface light emitting device through the electrode wiring and the p-side electrode and the n-side electrode, said method comprising the steps of:

bringing a tip of the minute protrusion member in contact with or close to a surface of a conductive medium;

causing the current or the tunnel current to flow into the surface light emitting device through the conductive medium and the minute protrusion member; and

detecting a change in output light of the surface light emitting device by the photodetector, the change in the output light being caused by a change in the current due to a condition of the surface of the conductive medium.

78. A method of using a surface optical apparatus as an atomic force microscope, the surface optical apparatus having a surface optical device with a p-side electrode and an n-side electrode and a minute protrusion member, a substrate for supporting the surface optical device through an elastic supporter, and an electrode wiring comprising of at least a wire formed on the substrate and electrically connected to the p-side electrode or the n-side electrode, and in which a current is injected into or a voltage is applied across the surface optical device through the electrode wiring and the p-side electrode and the n-side electrode, said method comprising the steps of:

bringing a tip of the minute protrusion member in contact with or close to a surface of a medium; and

detecting a motion of the elastic supporter due to an

interatomic force between the tip of the minute protrusion member and the surface of the medium.

79. A method of using a surface optical apparatus as an atomic force microscope, the surface optical apparatus having a surface light emitting device with a p-side electrode and an n-side electrode and a minute protrusion member, a substrate for supporting the surface light emitting device through an elastic supporter, and an electrode wiring comprising of at least a wire formed on the substrate and electrically connected to the p-side electrode or the n-side electrode, and a photodetector for receiving light from the surface light emitting device, and in which a current is injected into or a voltage is applied across the surface light emitting device through the electrode wiring and the p-side electrode and the n-side electrode, said method comprising the steps of:

injecting a current into the surface light emitting device to emit light therefrom;

bringing a tip of the minute protrusion member in contact with or close to a surface of a medium;

causing a motion of the elastic supporter due to an interatomic force; and

detecting a change in a position of the light received by the photodetector, the change in the position being caused by a motion of the elastic supporter due to an interatomic force between the tip of the minute protrusion member and the surface of the medium.

80. A method of using a surface optical apparatus as an optical pincette, the surface optical apparatus having a surface optical device with a p-side electrode and an n-side electrode and a member with a minute opening for generating evanescent light, a substrate for supporting the surface optical device, and an electrode wiring comprising of at least a wire formed on the substrate and electrically connected to the p-side electrode or the n-side electrode, and in which a current is injected into or a voltage is applied across the surface optical device through the electrode wiring and the p-side electrode and the n-side electrode, said method comprising the steps of:

injecting the current into the surface optical device to generate the evanescent light;

trapping a small particle by the evanescent light;

moving the small particle to a desired position; and

stopping the current to terminate the evanescent light and place the small particle at the desired position.